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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/528,387	09/21/2005	Lesley Ann Key	608-452	4683

23117 7590 11/28/2007
NIXON & VANDERHYE, PC
901 NORTH GLEBE ROAD, 11TH FLOOR
ARLINGTON, VA 22203

EXAMINER	
OH, TAYLOR V	
ART UNIT	PAPER NUMBER
1625	

MAIL DATE	DELIVERY MODE
11/28/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/528,387	KEY ET AL.	
	Examiner	Art Unit	
	Taylor Victor Oh	1625	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 March 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-9 and 11-16* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-9 and 11-16* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *3/05*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

The Status of Claims:

Claims 1-9, and 11-16 are pending.

Claims 1-9, and 11-16 are rejected.

DETAILED ACTION

Priority

1. It is noted that this application is a 371 of PCT/GB03/03834 (09/03/2003); the examiner has acknowledged that applicants have filed foreign priority documents ,United Kingdom 0221800.6 (09/19/2002).

Drawings

2. None.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-9, and 11-16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 1, the phrase " a reactive derivative thereof" is recited. These expressions are vague and indefinite because the specification does not elaborate

what is meant by the phrase " a reactive derivative thereof". Therefore, an appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-8, and 11-15 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Baker et al (EP 0749948).

Baker et al discloses the process for the carbonylation of alkyl alcohol such as methanol to produce the corresponding carboxylic acid and/or ester in the presence of an iridium catalyst, an alkyl halide and water along with a promoter selected from cadmium, mercury, zinc, gallium, indium and tungsten with a co-promoter selected from ruthenium, osmium and rhenium (see abstract page).

Furthermore, the concentration of the iridium catalyst composition is in the range of 100 to 6000 ppm by wt. of indium (see page 2 ,lines 53-54), whereas that of water in the liquid reaction composition is in the range of 1 to 15 % by wt. (see page 2 ,lines 40-41),

In addition, the following table 3 displays the results concerning the application of gallium and indium promote iridium/ruthenium to the carbonylation of methanol as shown bel (see page 9, table 3):

Table 3 Autoclave Charges

Experiment	Catalyst System (molar ratio)	Catalyst $IrCl_3.3H_2O$ (g)	Optional Co-Promoter $Ru_3(CO)_{12}$ (g)	Promoter	Amount of Promoter (g)	Methyl Acetate (g)	Water (g)	Methyl iodide (g)	Acetic Acid (g)
Example 13	Ir/Ru/Ga (1.2.2)	0.331	0.400	GaI_3	0.848	28.81	10.16	5.85	43.59
Example 14	Ir/Ru/In (1:2:2)	0.331	0.400	InI_3	0.926	28.82	10.17	5.88	43.49

This is identical with the claims.

4. Claims 1-3, 5-6,12-13 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Sunley et al (Catalysis Today 58 (2000) 293-307).

Sunley et al describes the followings (see abstract page):

> Methanol carbonylation to acetic acid is catalysed with high rates at low water concentrations using an iridium/iodide based catalyst. The catalyst system exhibits high stability allowing a wide range of process conditions and compositions to be accessed without catalyst precipitation. Two distinct classes of promoters have been identified for the reaction: simple iodide complexes of zinc, cadmium, mercury, indium and gallium and carbonyl complexes of tungsten, rhenium, ruthenium and osmium. The promoters exhibit a unique synergy with iodide salts, such as lithium iodide, under low water conditions. A rate maximum exists at commercially attractive low water conditions, and optimisation of the process parameters gives acetic acid with a selectivity in excess of 99% based upon methanol. The levels of liquid by-products formed are a significant improvement over that achieved with the conventional high water rhodium based catalyst system used in the Monsanto process and the quality of the product obtained under low water concentrations is exceptional. The Cativa&unknown; process has now been successfully commercialised on three world scale plants.

The following table 2 describes the various additives for iridium catalysed methanol carbonylation as shown below (see page 299, table 2).

Table 2
Batch autoclave data: effect of various additives on rate for iridium catalysed methanol carbonylation[a]

Experiment	Additive	Additive:Ir molar ratio	Carbonylation rate (mol dm^{-3} h^{-1})
1	None	-	8.2
2	LiI	1:1	4.3
3	Bu_4NI	1:1	2.7
4	$Ru(CO)_4I_2$	5:1	21.6
5	$Os(CO)_4I_2$	5:1	18.6
6	$Re(CO)_5Cl$	5:1	9.7
7	$W(CO)_6$	5:1	9.0
8	ZnI_2	5:1	11.5
9	CdI_2	5:1	14.7
10	HgI_2	5:1	11.8
11	GaI_3	5:1	12.7
12	InI_3	5:1	14.8
13	$InI_3/Ru(CO)_4I_2$	5:1:1	19.4
14	$ZnI_2/Ru(CO)_4I_2$	5:1:1	13.1
15	$Ru(CO)_4I_2$	Control — no Ir[b]	0[c]

[a] Reaction conditions: 190°C; 22 barg and 1500 rpm, autoclave charge: methyl acetate (648 mmol); water (943 mmol); acetic acid (1258 mmol); methyl iodide (62 mmol) and H_2IrCl_6 (1.56 mmol) plus additive as required, carbonylation rate (mol dm^{-3} h^{-1}), measured at 50% conversion of methyl acetate.
[b] Control experiment conducted in the absence of iridium; ruthenium complex amount used as in run 4.
[c] No CO uptake observed.

This is identical with the claims.

Claim Rejections - 35 USC § 103

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims rejected under 35 U.S.C. 103(a) as being unpatentable over ***.

3. Claims 1-9, and 11-16 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Baker et al (EP 0749948).

Baker et al discloses the process for the carbonylation of alkyl alcohol such as methanol to produce the corresponding carboxylic acid and/or ester in the presence of an iridium catalyst, an alkyl halide and water along with a promoter selected from cadmium, mercury, zinc, gallium, indium and tungsten with a co-promoter selected from ruthenium, osmium and rhenium (see abstract page).

Furthermore, the concentration of the iridium catalyst composition is in the range of 100 to 6000 ppm by wt. of indium (see page 2 ,lines 53-54), whereas that of water in the liquid reaction composition is in the range of 1 to 15 % by wt. (see page 2 ,lines 40-41),

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However, the instant invention differs from the prior art in that the claimed carbonylation is carried out in two reaction zones.

Even so, the prior art does teach that the process can be performed a batch or a continuous process (see page 4 ,lines 4-5). In the continuous process, the process requires usually more than one reaction vessel due to the space and time efficiency ; this can be related to the optimization of the overall reaction process. Therefore, it would have been obvious to the skilled artisan in the art to be motivated to employ the extract reaction vessel to the prior art process in order to maximize the space and time efficiency. This is because the skilled artisan in the art would expect such a modification to be feasible and successful with the purview of the skilled artisan in the art.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Taylor Victor Oh whose telephone number is 571-272-0689. The examiner can normally be reached on 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Janet Andres can be reached on 571-272-0867. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Taylor Victor Oh, MSD,LAC
Primary Examiner
Art Unit :1625

11/23/07